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ABSTRACT

The purpose of this paper was to provide professors of research methodology and statistics with an annotated bibliography of articles that can be used to teach a particular statistical technique as well as to illustrate specific concepts in research methodology. By using these articles in intermediate and advanced statistics classes, instructors can reinforce design concepts that students usually learn in earlier or previously taken methodology courses. Conversely, instructors of research methodology can use the articles to teach design issues as well as introduce statistics. Appendix A contains the annotated bibliography of articles sorted by statistical procedure. For each article, the first author's name, journal title, year of publication, volume number, pagination, and descriptive statistics are provided. The 71 articles are coded by major statistical procedure discussed, major design feature, noteworthy features, and difficulty level. Major statistical concepts discussed in the articles include, among others: (1) Chi square; (2) Pearson correlation; (3) t-tests; (4) one-way analysis of variance; (5) factor analysis; (6) regression; (7) discriminant analysis; (8) path analysis; and (9) analysis of covariance. Major designs reviewed are: (1) correlational; (2) pre-experimental; (3) quasiexperimental; (4) true experiment; (5) causal comparative/ex post facto; (6) descriptive; (7) meta analysis; (8) single subject; (9) qualitative; and (10) causal model. Appendix B contains the code sheet used to identify features of each article. (Author/SLD)

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Sources for Integrating Research Methodology and Statistics Instruction: An Annotated Bibliography

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Paper Presented at the

American Educational Research Association Conference

April 6, 1991

Running Head: SOURCES FOR INTEGRATING RESEARCH

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Abstract

The purpose of this paper was to provide professors of research methodology and statistics with an annotated bibliography of articles that can be used to teach a particular statistical technique as well as to illustrate specific concepts in research methodology. By using these articles in intermediate and advanced statistics classes, instructors can reinforce design concepts learned in earlier methodology courses. Conversely, instructors of research methodology can use the articles to teach design issues as well as to introduce statistics.

Sources for Integrating Research Methodology and Statistics Instruction: An Annotated Bibliography

As instructors of research methodology and statistics classes, we have been concerned with the lack of transfer students exhibit as they progress through our research methodology and statistics sequence. Many students in statistics classes concentrate so much on the computation and data analysis skills required that the basic methodology and design concepts taught in the prerequisite courses are forgotten. We discovered this problem when we read research papers written by students in intermediate statistics classes. Students had problems with such basic skills as formulating problems, establishing the study's significance, finding relevant sources, writing a critical literature review, addressing design and measurement issues, and citing limits of internal and external validity. In contrast, in the first research methodology class where the above concepts are taught, we had the opposite problem. We found it difficult to "fit in" the statistics component.

In response to these problems, we searched the literature for articles that employ the statistics we teach in our classes as well as illustrate some key research design issue. Some of the selected articles were empirical studies of research design techniques that students in statistics classes used as models for writing their own results section and tables. In addition, in class discussion we could integrate a relevant research design issue. Conversely, students in the

methodology classes concentrate on a particular design issue, but we introduced statistics as one component of the research study.

The use of articles in research methodology classes is quite commonplace. Numerous texts on the market supplement research methodology information with research articles. In contrast, few of the popular statistics texts we surveyed presented articles to supplement or illustrate the methodological issues. An exception is Multivariate data analysis, with readings (Hair Jr., Anderson, Tatham, & Grablowsky, 1979). Although many statistics texts integrate real data and refer to or use original studies such as the High School and Beyond Study (HSB) or the National Longitudinal Study (NLS), the emphasis is on data analysis rather than research methodology. In our experience, we had to go one step further to assist our students in transferring their learning from the methodology course by using supplementary articles that used the relevant statistic but that also illustrated a fundamental methodological issue or problem. Unless directly taught, students did not naturally integrate design issues in statistics classes. Students needed reinforcement to see the interrelationship between statistics and research methodology.

Method

Through ERIC, Psychological Abstracts, and Social Science Abstracts, articles were identified. Articles were examined using several criteria: use of a statistic taught in the course, level of difficulty, and discussion/illustration of a research design or methodology issue. Articles were coded using DBase IV so the bibliography could be sorted by procedure, difficulty, major statistic used,

or research design. The procedures selected ranged from descriptive statistics to multivariate procedures such as discriminant analysis.

An annotated bibliography of the articles sorted by statistical procedure is attached in Appendix A. The coding sheet used to classify articles is attached in Appendix B.

Reference

Hair, J. F., Jr., Anderson, R. E., Tatham, R. L., & Grablowsky, B. J. (1979). Multivariate data analysis: With readings. Tulsa, OK: PPC Books.

Appendix A

Annotated Bibliography Sorted by Design

Sources for Integrating Research Methodology and Statistics Instruction: An Annotated Bibliography

Patricia Harrington Klass and Noreen Michael
Illinois State University
Normal, Illinois 61761

Paper Presented at
American Educational Research Association Annual Conference
April 6, 1991

CODING SHEET

MAJOR STATISTICS (Stats1/2)

0 none
1 descriptive
2 chi square
3 pearson correlation
4 independent t
5 dependent t
6 one-way ANOVA
7 factorial ANOVA
8 ANCOVA
9 regression
10 MANOVA/rep. measures
11 Discriminant analysis
12 factor analysis
13 canonical correlation
14 path analysis
15 structural models
16 other

MAJOR DESIGN (Design)

1 correlational
2 pre-experimental
3 quasi-experimental
4 true experiment
5 causal-comp./ex post f
6 descriptive
7 meta-analysis
8 single subject
9 qualitative
10 causal model
11 other

NOTEWORTHY FEATURES (Note1/2)

0 none
1 problem statement
2 literature review
3 hypothesis/question
4 sampling
5 instrument/rel. & validity
6 variable selection/definition
7 internal validity
8 results or tables
9 connect results to literature
10 limitations noted
11 generalizability
12 conclusion
13 other

DIFFICULTY LEVEL (Diff)

1 Introduction to Research & Statistics
2 Intermediate Level
3 Advanced or Multivariate topics

Author	(Year)	Vol	Pages	Stats1	Stats2	Note1	Note2	Design	Diff
Title Journal									
Turner C.J.	(1981)	41	1223 - 1229	12	4	2	5	1	3
The reliability and factorial validity of the questionnaire on the quality of relationships in hospitals Educational and Psychological Measurement									
Getzlaf S.B.	(1984)	20	257 - 268	11	0	2	9	1	3
Two types of voluntary undergraduate attrition: Application of Tinto's model Research in Higher Education									
Ziv A.	(1989)	129	759 - 768	3	9	3	6	1	2
Humor and marital satisfaction The Journal of Social Psychology									
Miskel C.G.	(1979)	15	97 - 118	9	7	3	5	1	3
Organizational structures and processes, perceived school effectiveness, loyality, and job satisfaction Educational Administration Quarterly									
Feinberg L.B.	(1978)	46	11 - 18	3	2	3	13	1	1
Affective and cognitive correlates of course performance in introductory statistics Journal of Experimental Education									
Ollila L.D.	(1984)	80	47 - 52	9	0	2	8	1	1
Predicting first-grade students' writing achievement using the Canadian Readiness Test and selected measures of cognitive development Journal of Educational Research									
Steiner D.D.	(1987)	8	71 - 77	9	0	8	9	1	3
Another look at the job satisfaction-life satisfaction relationship: A test of the disaggregation hypothesis Journal of Occupational Behaviour									

Author Title Journal	(Year)	Vol	Pages	Stats1	Stats2	Note1	Note2	Design	Diff
Dickinson Effect of quality and quantity of study on student grades Journal of Educational Research	D.J. (1990)	83	227 - 231	4	9	6	11	1	1
Heberlein Factors affecting response rates to mailed questionnaires: A quantitative analysis of the published literature. American Sociological Review	T.A. (1978)	43	447 - 462	14	9	6	13	1	3
Bean The relationship between author gender and the methods and topics used in the study of college students Research in Higher Education	J.P. (1988)	28	130 - 144	11	6	9	13	1	3
Roth Life events, fitness, hardiness, and health: A simultaneous analysis of proposed stress-resistance effects Journal of Personality and Social Psychology	D.L. (1989)	57	136 - 142	9	15	2	9	1	3
Schoenfeldt Patterns of college grades across curricular areas: Some implications for GPA as a criterion American Educational Research Journal	L.F. (1975)	12	313 - 321	12	3	2	8	1	3
Kerr Scholastic aptitude and achievement as predictors of perfomance on teacher competency tests: A further investigation Journal of Educational Research	M.E. (1987)	80	266 - 271	13	0	5	8	1	3
Estabrook A canonical correlation analysis of the Wechsler Intelligence Scale for Children-Revised and the Woodcock-Johnson Tests of Cognitive Ability in . . Journal of Educational Psychology	G.E. (1984)	76	1170 - 1177	13	0	8	9	1	3
Greenwood Some relationships between teacher morale and teacher behavior Journal of Educational Psychology	G.D. (1973)	64	105 - 108	3	0	5	2	1	1

Author Title Journal	(Year)	Vol	Pages	Stats1	Stats2	Note1	Note2	Design	Diff
Borrello Correlates of selected test-wiseness skills The Journal of Experimental Education	G.M. (1985)	53	124 - 128	9	0	2	9	1	3
Dreher A comparative study of mentoring among men and women in managerial, professional, and technical positions Journal of Applied Psychology	G.F. (1990)	75	539 - 546	9	4	1	8	1	3
Homan Does teacher oral reading of test items affect the performance of students of varying reading ability? Journal of Educational Research	S. (1986)	79	363 - 365	7	16	0	7	2	2
Robinson The effects of guided discovery LOGO instruction on mathematical readiness, visual-motor integration, and attendance of first grade students Journal of Human Behavior and Learning	M.A. (1988)	5	1 - 11	4	0	3	7	2	1
Edwards The relationship between type of teacher reinforcement and student inquiry behavior in science. Journal of Research in Science Teaching	C.H. (1980)	17	337 - 341	6	0	8	7	2	1
Mathews Understanding families of academically gifted children Roeper Review	F.N. (1986)	9	40 - 43	4	0	9	7	2	2
Medora Premarital sexual opinions of undergraduate students at a midwestern university Adolescence	N. (1982)	17	213 - 224	4	6	6	8	2	1
Robinson Effects of confluent education on high school students identified as learning disabled The Exceptional Child	C.A. (1986)	33	193 - 197	5	0	7	12	2	1

Author Title Journal	(Year)	Vol	Pages	Stats1	Stats2	Note1	Note2	Design	Diff
Ritter Teaching middle school students to use a test-taking strategy Journal of Educational Research	S. (1986)	79	350 - 357	8	4	10	6	3	2
Lewis-Beck Some economic effects of revolution: Models, measurement, and the Cuban evidence American Journal of Sociology	M.S. (1979)	84	1127 - 1149	16	0	2	13	3	3
Johnson An evaluation of Saxon's algebra text Journal of Educational Research	D.M. (1987)	81	97 - 112	10	4	3	10	3	3
Lewis-Beck Can government regulate safety? The coal mine example The American Political Science Review	M.S. (1980)	74	745 - 756	16	4	8	9	3	3
Lee A comparison of achievement and attitudes among three methods of teaching educational psychology Journal of Educational Research	M.M. (1978)	72	86 - 90	6	5	2	4	3	3
Dwyer The effect of rehearsal method and rehearsal time on students' information acquisition and retrieval Journal of Instructional Psychology	C.A. (1986)	13	25 - 31	6	7	8	5	4	2
Smith A low-inference indicator of lesson structure in mathematics The Journal of Experimental Education	L.R. (1984)	53	102 - 105	1	4	8	11	4	1
Denner Effects of story impressions as a prereading/writing activity on story comprehension Journal of Educational Research	P.R. (1989)	82	320 - 324	7	0	2	8	4	2

Author Title Journal	(Year)	Vol	Pages	Stats1	Stats2	Note1	Note2	Design	Diff
Zusman B.J. An evaluation of the use of monetary incentives in postsecondary survey research Journal of Research and Development in Education	(1987)	20	73 - 78	2	0	1	4	4	1
Johnson R.T. Effects of cooperative, competitive, and individualistic learning experiences on social development Exceptional Children	(1983)	49	323 - 329	10	6	6	1	4	3
Routzel D.R. Reading time in school: Effect on fourth graders' performance in a criterion-referenced comprehension test Journal of Educational Research	(1991)	84	170 - 176	8	10	5	12	4	3
Evertson C.M. Training teachers in classroom management: An experimental study in secondary school classrooms Journal of Educational Research	(1985)	79	51 - 58	7	0	13	1	4	1
Davis D.D. Ackoff's management misinformation systems empirically revisited via simulation Simulation and Games	(1986)	17	60 - 74	4	0	3	8	4	1
Buczek T.A. A promising measure of sex bias: The incidental memory task Psychology of Women Quarterly	(1984)	10	127 - 140	10	0	11	9	4	3
Johnson D.W. Effects of cooperative, competitive, and individualistic conditions on children's problem-solving performance American Educational Research Journal	(1980)	17	83 - 93	6	10	2	6	4	1
Cleary M.L. The effects on two- and three-day-per-week aerobic dance programs on maximal oxygen uptake Research Quarterly for Exercise and Sport	(1984)	55	172 - 174	8	0	8	8	4	2

Author Title Journal	(Year)	Vol	Pages	Stats1	Stats2	Note1	Note2	Design	Diff
Williams J.M. The effect of high and low assertivenes on locus of control and health problems The Journal of Psychology	(1985)	119	169 - 173	4	3	5	7	5	1
Crosser S.L. Summer birth date children: Kindergarten entrance age and academic achievement Journal of Educational Research	(1991)	84	140 - 146	5	1	5	8	5	1
Peterson S.E. A longitudinal study of the effects of retention/promotion on academic achievement American Educational Research Journal	(1987)	24	107 - 118	10	1	8	4	5	3
Colangelo N. Labeling gifted youngsters: Long-term impact on families Gifted Child Quarterly	(1981)	31	75 - 78	5	0	2	1	5	1
Mounts N.S. Social cognitive play patterns in same-age and mixed-age preschool classrooms American Educational Research Journal	(1987)	24	463 - 476	4	0	8	9	5	1
Hughes J.M. Performance of disturbed and nondisturbed boys on a role play test of social competence Behavioral Disorders	(1985)	11	24 - 29	5	0	2	5	5	1
Dyson L. Stress and adaptation in parents of young handicapped and nonhandicapped children: A comparative study Journal of the Division for Early Childhood	(1986)	10	25 - 35	5	3	2	9	5	1
Allan E.T. Effects of socioeconomic status and sex on preschool children's activity. Creative Child and Adult Quarterly	(1988)	13	91 - 96	7	0	2	8	5	2

Author Title Journal	(Year)	Vol	Pages	Stats1	Stats2	Note1	Note2	Design	Diff
Castenell L.A. Achievement motivation: An investigation of adolescents' achievement patterns American Educational Research Journal	(1983)	20	503 - 510	7	0	2	7	5	2
Bowman R.P. Small-group guidance and counseling in schools: A national survey of school counselors The School Counselor	(1987)	34	256 - 262	2	6	1	8	6	1
Krupka L.R. College student attitudes toward aids carriers and knowledge of the disease College Student Journal	(1988)	22	263 - 269	2	0	8	12	6	1
Jacobs G.A. Family smoking patterns and smoking among eighth and tenth grade students Applied Psychology: An International Review	(1988)	37	289 - 299	2	10	9	5	6	3
Young I.P. An examination of job satisfaction for female and male public school superintendents Planning & Changing	(1984)	15	114 - 124	11	4	12	5	6	3
Murphy J. Teachers' use of homework in high schools Journal of Educational Research	(1989)	82	261 - 269	1	0	3	8	6	1
Holmes C.T. The effects of nonpromotion in elementary and junior high school pupils: A meta-analysis Review of Educational Research	(1984)	54	225 - 236	16	0	8	13	7	2
Kulik J.A. Effectiveness of computer-based college teaching: A meta-analysis of findings Review of Educational Research	(1980)	50	525 - 544	1	3	13	9	7	2

Author Title Journal	(Year)	Vol	Pages	Stats1	Stats2	Note1	Note2	Design	Diff
Klauer Intentional and incidental learning with instructional texts: A meta-analysis for 1970-1980 American Educational Research Journal	K.J. (1984)	21	323 - 339	16	3	6	8	7	3
Stone A meta-analysis of advance organizer studies Journal of Experimental Education	C.L. (1983)	51	194 - 199	16	0	3	13	7	2
Sherburne Decreasing violent or aggressive theme play among preschool children with behavior disorders Exceptional Children	S. (1988)	55	166 - 172	1	0	6	12	8	1
Rolider Training parents to use extinction to eliminate nighttime crying by gradually increasing the criteria for ignoring crying Education & Treatment of Children	A. (1984)	7	119 - 124	16	0	7	8	8	1
van der Mars Effects of specific verbal praise on off-task behavior of second grade students in physical education Journal of Teaching in Physical Education	H. (1989)	8	162 - 169	1	0	5	10	8	1
Warren Context and isolation: The teaching experience in an elementary school Human Organization	R.L. (1975)	34	139 - 148	0	0	13	2	9	1
Claesson Teacher/mothers: Effects of a dual role American Educational Research Journal	M.A. (1989)	26	1 - 24	0	0	8	9	9	1
Zaharik Stability and flexibility in teaching Teaching and Teacher Education	J.A. (1990)	6	69 - 80	0	0	2	8	9	1

Author Title Journal	(Year)	Vol	Pages	Stats1	Stats2	Note1	Note2	Design	Diff
Turner R. Policy strategy, teacher salary incentive, and student achievement: An explanatory model Educational Researcher	(1986)	15	5 - 11	15	14	8	13	10	3
Burke M.J. A path analytic model of the direct and indirect effects of mathematical aptitude and academic orientation on high school and college performance Educational and Psychological Measurement	(1982)	42	545 - 550	14	9	2	8	10	3
Bollen K.A. Issues in the comparative measurement of political democracy American Sociological Review	(1980)	45	370 - 390	15	12	5	8	10	3
McLaughlin G.W. Factors which comprise salary Research in Higher Education	(1978)	8	67 - 82	14	9	6	2	10	3
Parkerson J.A. Exploring causal models of educational achievement Journal of Educational Psychology	(1984)	76	638 - 646	15	16	3	2	10	3
Rosenthal N.R. Assessing gender bias in computer software Computers in the Schools	(1988)	5	153 - 163	2	0	3	12	11	1
Goldsmith R.E. Reducing spurious response in a field survey The Journal of Social Psychology	(1989)	129	201 - 212	8	0	9	11	11	3
Israel R.G. Response time comparisons among four base running starting techniques in slow pitch softball Research Quarterly for Exercise and Sport	(1981)	52	324 - 329	10	0	5	8	11	3

Appendix B

Coding Sheet for Dbase IV Program

CODING SHEET FOR RESEARCH METHODOLOGY AND STATISTICS ARTICLES

Author Last: _____ **Initials:** _____

Other Authors (et al.): _____

Year: (_____)

Title: _____

_____

Journal: _____

Vol: _____ **No:** ___ **Page numbers:** _____

Journal Call Number: _____ **Copyright Cost:** _____

Difficulty Level: ___1 (Introductory) ___2 (Intermediate) ___ 3 (Advanced)

Major Statistic 1
1 ___ descriptive
2 ___ chi square
3 ___ pearson corr
4 ___ indep. t
5 ___ dep. t
6 ___ one-way ANOVA
7 ___ factorial ANOVA
8 ___ ANCOVA
9 ___ regression
10 ___ MANOVA/repeated m.
11 ___ Discriminant
12 ___ factor analysis
13 ___ canonical
14 ___ path
15 ___ other struc. model
16 ___ other _____

Major Statistic 2
1 ___ descriptive
2 ___ chi square
3 ___ pearson cor
4 ___ indep. t
5 ___ dep. t
6 ___ one-way ANOVA
7 ___ factorial ANOVA
8 ___ ANCOVA
9 ___ regression
10 ___ MANOVA/repeated m.
11 ___ Discriminant
12 ___ factor analysis
13 ___ canonical
14 ___ path
15 ___ other struc. model
16 ___ other _____

Design
1 ___ correlation
2 ___ pre-experimental
3 ___ quasi-experimental
4 ___ true experiment
5 ___ causal-com/ex post
6 ___ descriptive
7 ___ meta-analysis
8 ___ single subject
9 ___ qualitative
10 ___ causal model
11 ___ other _____

NOTE 1
1 problem statement
2 lit review
3 hypothesis/quest
4 sampling
5 instrument/r & v
6 variable sel/def.
7 internal validity
8 results/tables
9 connect res. to lit
10 limits
11 generalizability
12 conclusion
13 other _____

AD/DIS 1
0 ___ (-)
1 ___ (+)

NOTE 2
1 problem state.
2 lit review
3 hypothesis/quest
4 sampling
5 instrument/r & v
6 variable sel/def.
7 internal validity
8 results/tables
9 connect res. to lit
10 limits
11 generalizability
12 conclusion
13 other _____

AD/DIS 2
0 ___ (-)
1 ___ (+)

WORTH:
Is this article worth xeroxing/using for class?
0 ___ (no!) 1 ___ (maybe) 2 ___ (yes!)

Comments: _____

_____

_____